

CASE HISTORY 1

MARKED TREE HIGH SCHOOL

Denishia Buchanan

Biology Teacher

Marked Tree High School

Marked Tree, Arkansas

Our first case history comes from Denishia Buchanan, a biology teacher in Arkansas (see Figure CH1.1). She notes that 80% of her students fall below the poverty line and typically do not perform well in school, with many failing to graduate.

An avid gamer, Denishia was a natural when it came to designing a multiplayer classroom. Her leveling system adds an ingenious time element, and her quests are given by special quest givers within the classroom, such as the one who consented to pose with her below in Figure CH1.1.

Her questing system is so successful—have a look at the remarkable statistics—that she’s planning quests for her Anatomy class. And the school’s administrators are encouraging other teachers to do the same.

Here is her own quest to reach and teach students more used to struggling than success.



Figure CH1.1

Denishia Buchanan with one of her quest givers: Princess Sodabottle.

INTRODUCTION

Gaming and education aren't usually two words that go together; however, after reading an article published by *The Chronicle of Higher Education* detailing Lee Sheldon's unique technique of creating a gaming experience for his multiplayer design class, I was intrigued. If pop culture has taught us anything, it's that most teenagers would rather spend more time playing video games than finishing school work. The article explained that Mr. Sheldon uses experience points in his class instead of the traditional point system that is used in modern education. His entire classroom is based on popular gaming themes. His classwork is set up like quests that may either be solo'd or completed in a pick-up group, as well as having groups of students sit together to form guilds.

Upon reading the article, I began brainstorming on my own version of gaming in the classroom. Being an avid gamer for the majority of my life allowed me to use my personal experiences in various gaming situations to design a high school version of Mr. Sheldon's technique. Beginning in the 2010–2011 school year, three sophomore level biology classes began playing "Biology Quest."

Students who play “Biology Quest” are required to reach levels of achievement in a certain amount of time. To reach these levels, students must gather experience points (XP). Students have various opportunities to obtain these points. For example, Level 1 requires 100 XP and has a due date of one week. Students are required to quest (complete various assignments) to gain these 100 experience points. When the due date arrives, whatever the student has gathered goes into the grade book. For example, Amanda has completed all three section reviews for Chapter 1 worth 10 XP and made a 60 on the Chapter 1 exam. A 70% is recorded for Amanda’s Level 1 score. As the level requirements increase, students must complete more assignments to achieve at higher levels.

In addition to questing experience, students are also awarded “Biology Bucks.” Each quest is given a monetary value based upon how difficult and what level the quest is. Students use the Biology Bucks to buy classroom supplies and even hall passes to the library or restroom.

“Biology Quest” is a way for students to immerse themselves into the discipline. It allows students to expand their knowledge further than a typical classroom would allow. Students are given the freedom to pick and choose assignments that they feel they would perform best at. In “Biology Quest,” every learning style has the opportunity to shine.

LEVELS

Level	Experience Points Required	Time to Complete	Semester
1	100	1 week	Fall
2	200	2 weeks	Fall
3	400	2 weeks	Fall
4	800	4 weeks	Fall
5	1600	4 weeks	Fall
6	3200	6 weeks	Spring
7	6400	6 weeks	Spring
8	12800	6 weeks	Spring

For the fall semester

A	2760 points
B	2480 points
C	2449 points
D	1872 points
F	Below 2182

For the spring semester

A	21696 points
B	19296 points
C	16896 points
D	14496 points
F	Below 14495

QUESTING

Quests are class assignments that students complete for experience points and Biology Bucks. Quests are assigned experience points based upon how difficult the quest is to complete. In “Biology Quest,” students are only allowed to complete quests solo. They may help one another, but copying is strictly prohibited.

Quests are provided to students by “quest givers.” These are different inanimate and living objects throughout the room that provide quests to the students. The quest-givers are Big Chief Waterwalker, our classroom mascot; Luke and Waylon, the classroom turtles; Oscar the Vile, our very hungry cichlid; and Princess Sodabottle, our recycled plastic skeleton model. Each “quest giver” presents quests to students in a narrative. The narrative explains what is expected on the quest, as well as what rewards will be provided. For example, see the following note.

It's All in the Strategy

Hey man. . .Waylon just won't listen to me. I've been trying to tell him about k-strategists and r-strategists. He just doesn't listen. This is what I want you to do. I want you to write a children's book about k and r strategists. Explain it in terms that Waylon could understand. After all, he is only three years old. Make the book at least six pages long. Be sure to include pictures of the different kind of strategists. Waylon always judges a book by its cover, so make the cover SUPER exciting!

50 XP and 5 Bucks

Quests are provided for the students in two forms. One, all quests are placed in a classroom quest log booklet. This booklet contains quests from every quest giver from Level 1 to the current level that students are completing. Second, at the beginning of a new level, all students receive a copy of each quest to put in their own quest log folder. This ensures that all students know what quests are available for the current level.

Quests are designed to reach every skill level and learning style. Each level has quests that appeal to visual learners, auditory learners, and kinesthetic learners. Students complete a survey to determine their learning style. They are then challenged to develop skills in learning styles other than the style they were most competent in.

Quests are designed to expand student thinking. Although some quests are small review sections or worksheets, the majority of quests are high-level assignments. Students must create websites, make brochures, write essays, create learning cubes, make models, develop analogies, write rap songs, and several different multimedia projects.

For 25 minutes each day, I teach students the "lore" of biology. This is usually presented as a whole group classroom activity, lecture, or a lab activity. During this time, I present the essential information about the current topic of study. Quests will provide more detailed "lore" through an inquiry process. After this is completed, the students have 20 minutes to quest.

During quest time, students have access to computers. They may use these computers to access the Internet or use programs such as Windows Movie Maker to complete their quests. Students also have access to an extensive craft supply. They may use boxes, Styrofoam balls, clay, markers, colored pencils, and so on, to complete their quests. Students may also leave the classroom to do

library research. Students must use every minute of quest time on quests. They aren't allowed to sit and look pretty.

Quests must be turned in complete and perfect. If the quest giver requires a project to be colorful and the student turns in the work uncolored, no points will be received. The student must finish the project. If the quest is a worksheet, lab, or bookwork, all questions must be answered to the fullest extent. All essays turned in must follow the English department's guidelines for sentence structure, paragraph structure, and essay format. If a student fails a dungeon quest (tests), then the dungeon must be attempted again until they receive a 60%.

REWARD SYSTEM

Students are rewarded for completing quests not only in quest XP, but also in Biology Bucks. Biology Bucks are dollars that students can spend within the Biology classroom. In student's quest logs, each quest denotes the XP value, as well as a monetary value. Most quests award \$1–\$20 Biology Bucks, depending on the difficulty and the time required to complete a project. When the quest has been graded and deemed worthy, students will receive the quest back, as well as the Biology Bucks at which the quest was valued. If a student has completed a quest above and beyond the required elements, then extra money is allotted, and the quest gets placed on a wall of fame.

Students may use their Biology Bucks in several ways. First, they may use it at various vendors to buy needed classroom supplies, such as pencils and paper. Secondly, they may use the money to obtain special hall passes, such as bathroom or library passes. Finally, they may use their money at the Auction House.

I provide the students with two vendors for classroom supplies. The first vendor sells students classroom supplies. They may buy one pencil for one Biology Buck. The same is true for paper. A spiral notebook will cost the student \$3 Biology Bucks. A paper folder will only cost \$1. Other items may be rented from the second vendor. Rentable items include Biology Books or Classroom Reference Books. These are rented with a \$5 dollar deposit. When the book is returned, the \$5 Biology Bucks are returned.

Every nine weeks, students are invited to attend an auction. Auctions are funded by the Science Club through various fundraisers. Auctions are presented to students in two ways: a silent auction and a typical English auction. The silent

auction involves big-ticket items that every single questing class can participate in. For instance, in this nine-week period, students are bidding on a \$100 Visa gift card. Students must place their bid for the gift card in a box. After the auction expires, the highest bidder wins the card. The English auction pits students in the same class period in bidding wars vying for various items, including hall passes, coupon books, small gift certificates, lotions and sprays, as well as food items.

STUDENT OPINIONS

My students are very pleased with this form of class. Students have expressed that knowing exactly how many points are expected of them and offering various methods of obtaining these points allow them to achieve higher. Several other students said that having a reward at the end of nine weeks (like our auctions) was great motivation for them to do more work. Students state that they would like other teachers to use this method in their classrooms.

The classes that are not questing complain that it is unfair and that if they had that opportunity when they were in Biology, they would have scored much higher. My AP Biology class begs me to begin questing with them. Several students have come up to me in the hallway and said that they cannot wait to be in my class so that they can quest.

Because of questing, many students feel more confident in science. A lot of students have told me that they would like to pursue a career in nursing, veterinary medicine, nuclear medicine, and engineering, just to name a few. Students feel that when they are given a choice in the type of work they do in classes, they will produce more work with more effort.

DATA ANALYSIS

Marked Tree High School is 80% free and reduced lunch, meaning that 80% of our students fall below the poverty line. Typically, these students do not perform well in school, and many of them fall short of high school graduation. Many students that do make it to graduation do not go on to college. Most never even take their ACT.

In December of 2009, 62% of the sophomores taking Biology were passing with a D or higher. These students were taking a Biology class taught in the traditional

format. In December 2010, 98% of sophomores taking Biology were passing with a D or higher, 36% of whom had an A or a B. This is compared to 2009's 10% having an A or a B. The increase in scores is in direct relation to questing.

Each quarter, students must take an End of Course Practice Test. Students must score 60% to be considered proficient in Biology. The EoC is a comprehensive test. In October 2009, students were 29% proficient or higher on this exam. In the 2010 administration, 68% were proficient or advanced. At this time, the 2010 students had been questing for nine weeks. The second administration was given in December. In 2009, students scored 31% proficient or advanced. The results from the 2010 test showed that 81% of the students were scoring proficient or advanced.

Not only is questing increasing the percentage of students scoring proficient or advanced, but it is also increasing the number of students that are advanced in Biology. In 2009, only 3% of the students were scoring advanced. This year, 55% are scoring advanced.

CONCLUSION

Questing, without a doubt, increases student motivation, student attitude, and student performance. Data proves this fact. Students in my classroom are doing three times the amount of work that students completed in previous years, and they are doing it with joy and without complaint. Work that is turned in shows that the student has spent time and energy on it. All work shows that the student took pride in completing this work. Allowing students to choose assignments that they feel they are good at provides an atmosphere for students to extend their thinking and dive deeper into a topic than ever before.

Questing has provided an opportunity for my students that they never had before. Through questing, they feel confident in their work. Knowing that they can succeed in a difficult class makes them want to pursue more opportunities within that subject. I have several students who would never have considered taking AP Biology before, and now they have signed up for the class.

My students have asked me to extend questing into other classes. I will do this. I have already begun planning questing assignments for the second semester of my Anatomy class. My administration is seeing our students' performance increase by leaps and bounds and because of this is encouraging other core subjects to incorporate this type of learning into their classroom.